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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/537,702

02/17/2006

Rainer Eichholz

2133.091USU

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7590

06/19/2009

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EXAMINER

LAZORCIK, JASON L

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

06/19/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/537,702	Applicant(s) EICHHOLZ ET AL.	
	Examiner JASON L. LAZORCIK	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30 and 72-104 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30 and 72-104 is/are rejected.
- 7) ☒ Claim(s) 78,94 and 96 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/17/2006, 6/2/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II (claim 30) drawn to an apparatus for heating of melts in the reply filed on May 5, 2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Status of the Claims

Applicants reply dated May 5, 2009 cancels claims 1-29 and adds new claims 72-104. Applicants newly presented claims 72-104 have been compared to originally filed claims 31-71 dated June 2, 2005. The newly presented claims have been determined to find adequate support in the noted original claim language and it is the examiners assessment that no new matter has been introduced by the newly presented claims.

Claim Objections

2. Claims 78, 94, and 96 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.
3. Claim 78 recites the limitation such that the device for cooling is sufficient to cool the melting material in contact with the at least two electrodes". The instant limitation is construed as a statement of intended use but said limitation does not appear to further limit the structure of the recited apparatus.

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4. Claim 94 recites the limitation such that the at least two electrodes are arranged below a melt bath surface. Again, the instant limitation appears to constitute a statement of intended use, and it is not evident that the instant limitation further limits the structure of the recited apparatus.

5. Claim 96 recites the limitation such that a bridge is immersed in the melt from above through a melt bath surface. Again, the instant limitation appears to constitute a statement of intended use, and it is not evident that the instant limitation further limits the structure of the recited apparatus.

6.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 80, 84, 86,87 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 80 recites the use of a low-pressure blower and restricts the blower to a specific operational pressure range, namely that said blower "builds up a pressure difference of less than 1,000mbar. It is not evident to the Examiner precisely what metric the differential pressure is measured with reference to. For example, is the pressure difference an internal pressure drop, a measure of internal coolant pressure to ambient pressure conditions, or some other metric. In view of the foregoing, the precise metes and bounds of Applicants recited invention are rendered unclear and indefinite.

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Claim 84 recites the limitation such that the vessel may comprise skull walls or ceramic walls in the alternative, however dependent claim 86 appears to thereafter require the presence of the skull walls (see lines 1 and 2). In view of the conflicting language, it is not entirely evident whether the skull walls are a requisite or optional element of the recited apparatus. For this reason, the precise metes and bounds of Applicants invention are rendered unclear and indefinite.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 30, 72-79, 81-85, 88, 91-104 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Atkinson (US 2,159,361).

Regarding independent claim 30 and with reference to the instant figures 1-3, Atkinson teaches a melting vessel (10) with cooled walls (22) and at least two electrodes (15,16) having a melt contact surface that replaces a portion of the cooled walls of the melting vessel (10).

Regarding Claim 72, At least a portion of the electrode (17,18,19,20) protrudes through cutouts in the cooled walls (35) of the melting vessel.

Regarding Claims 73-75 and with reference to the instant figures 4 and 5, each electrode (36,37) replaces approximately half (e.g. ~44%) of the surface of respective wall (35).

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Regarding claims 76, 77,78,79, 81,82,83 each electrode (for example 40, 41, 43,44) comprises a separate cooling passages or circuits (22, 45) or cooling device or fluid conveying device (pg 3, col.1, lines 38-43). Said cooling passages are construed to be structurally capable of extracting heat from the material in the body of the furnace and to be capable of carrying more than one type of cooling media. Atkinson notes that the cooling means (45) are "adapted to maintain the terminals at a sufficiently cool temperature". In view of the foregoing, it is the Examiners assessment the cooling means (45) implicitly read on the "device for controlling the cooling power of the at least two electrodes" as recited in claim 82 or that such a general means is inherently required to achieve the disclosed furnace operation as set forth by Atkinson.

Regarding claims 84-85, Atkinson teaches that the furnace is constructed from a refractory (e.g. ceramic) material (page 3, col. 1, lines 12-13). As noted above, Atkinson further teaches the use of cooling means (22 and 45) comprising tubes lined with an insulating refractory material on a side of the tube facing the melt (see for example figure 2 depicting refractory material 10 interposed between cooling means 22 and the molten material).

Regarding claim 88, although not explicitly set forth by Atkinson, it is the examiners assessment that the electrodes must necessarily be insulated from the walls of the melting vessel in order to operate in the manner without creating an electrical short circuit between respective electrodes.

Regarding claim 91, 92, 101-104 see page 2, column 2, lines 6-23

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Regarding Claims 93, 94 note vertical and horizontal placement of electrodes (16) and (36) in respective Figures 2 and 4 as well as opposing electrode arrangement in plan view of figure 3

Regarding claim 95, note that electrode shape (15,16,36, and 37) in figures 1-5 all constitute planar forms

Regarding claim 96 see elements (32) in figure 4 and see page 3, lines 55-58.

Regarding claim 97, 99,100, see page 3, lines 59-70.

Regarding claim 98, see page 3, lines 16-26 and element 12,33, and 68 in respective figures 2, 4, and 6

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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12. Claim 80 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atkinson (US 2,159,361) as applied above and further in view of the ordinary level of skill in the art at the time of the invention.

Regarding claim 80, Atkinson teaches the use of cooling means (22, 45) to cool the electrodes and the refractory walls in the vicinity of the electrodes. Said cooling means employ circulation of a fluid coolant, however the reference is silent regarding the use of a "low-pressure blower" or that said blower is configured build up a pressure difference of less than 1,000 mbar.

Although Atkinson is silent regarding the preferred coolant circulating means as presently recited in the instant claim, it is the Examiners assessment that one of ordinary skill in the art would have been fully equipped to specify an appropriate coolant circulation means for the cooling means in view of the Atkinson disclosure. That is, absent evidence to establish a substantially unexpected result derived from the recited limitation, it is the Examiners assessment that Applicants recited implementation of a "low-pressure blower" to circulate coolant fluid would have been viewed as an obvious extension over the Atkinson teachings for one of ordinary skill in the art at the time of the invention.

13. Claim 86-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atkinson (US 2,159,361) as applied above and further in view of the ordinary level of skill in the art at the time of the invention as established by De Jong et. al (Glass, Wiley-VCH Verlag GmbH & Co., (2005), pg 1-89).

Regarding claims 86-87, Atkinson teaches that the furnace is constructed from a refractory material (page 3, col. 1, lines 12-13). As noted above, Atkinson further teaches the use of cooling means (22 and 45) comprising tubes lined with an insulating refractory material on a side of the tube facing the melt. Atkinson is silent regarding the materials of construction for the cooling means, namely a metal as recited in claim 86, or the material of construction for the refractory, namely comprising a SiO₂ slip, as recited in claim 87.

De Jong demonstrates (see §5.2.1, pg 54; also see §5.7, pg 64) that glass melting furnaces conventionally employ silica, mullite, or ASZ as materials of construction for the refractory walls of high temperature glass melt furnaces. In view of the foregoing, Applicants recited claims stating that the refractory material comprises SiO₂ would have been obvious. Similarly metal would have been an obvious choice of material for constructing the channel of the cooling means since metals have a high thermal conductance, ease of fabrication, and thermal durability.

14. Claim 89-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atkinson (US 2,159,361) as applied above and further in view of Takajo (US 5,131,005).

Regarding claims 89-90, Atkinson teaches that the furnace heating system is configured for direct current or alternating current operation (pg 4, col.1, lines 7-32).

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Atkinson is silent regarding the preferred operational frequency when heating under AC conditions as recited in claims 89-90.

Takajo (US 5,131,005) teaches a crucible for melting glass materials wherein platinum electrodes are employed for generating heat to melt the material. Regarding the operational frequency of the power source, Takajo teaches the 50-60Hz is conventionally employed but that frequencies in the operational range of approximately 9kHz may be employed in order to avoid generation of platinum inclusion in the molten glass (see col. 1, lines 47-57)

In view of the Takajo reference, one of ordinary skill in the art would have found it obvious to employ a frequency generating source capable of operating in the range of 50Hz and up to about 9000Hz in the melting device of Atkinson. Specifically, Takajo teaches that 50-60Hz is conventional and that the higher frequency range may beneficially prevent inclusions from platinum electrodes similar to the type employed in Atkinson.

Double Patenting

15. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

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F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

16. Claims 30, 72, 76-86, 91-92, and 99-104 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 4, 10, 17, 25, 27, 32-34 of U.S. Patent No. 7,530,238.

17. Claims 1 and 34 of the '238 patent recite every limitation of the application claims 30, including, *inter alia*, a melting vessel with cooled walls (see '238 claims 34, 35) comprising at least one electrode (see '238 patent Claim 1) having a melt contact surface (see '238 patent Claims 17, 27, 34).

18. Regarding Application claims 72, 82, 84-86 see '238 patent Claims 1, 17, 27, 34

19. Regarding Application claims 76-80 see '238 patent Claims 1, 2, 4

20. Regarding Application claims 81 see '238 patent Claim 10

21. Regarding Application claims 91-92, 100-104 see '238 patent Claims 25

22. Regarding Application claims 99-100 see '238 patent Claims 32-33.

23. Claims 73-75, 87-90, 93-98 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over 1, 2, 4, 10, 17, 25, 27, 32-34 of U.S. Patent No. 7,530,238 variously in view of Atkinson (US 2,159,361), Takajo (US 5,131,005), and/or De Jong et. al (Glass, Wiley-VCH Verlag GmbH & Co., (2005), pg 1-89) as applied in the prior art rejections above.

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24. Claim limitations not explicitly recited in the '238 patent as noted above would have been construed as obvious extensions over said patent when viewed in light of the prior art references to Atkinson, Takajo, and/or De Jong as applied in the claim rejections above. That is, Atkinson teaches the relative electrode size and placement as well as the general geometry of the furnace, De Jong teaches conventional materials of construction for refractory furnaces employed in the glass forming arts, and Takajo teaches conventional power source frequency ranges for electrical heating of a glass melt.

25. Applicant is advised that should claim 84 be found allowable, claim 85 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON L. LAZORCIK whose telephone number is (571)272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason L Lazorcik/
Examiner, Art Unit 1791
26.